

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF HAWAII

In the Matter of)

PUBLIC UTILITIES COMMISSION)

Instituting a Proceeding to Investigate)
the Implementation of Feed-in Tariffs)
_____)

DOCKET NO. 2008-0273

**CLEAN ENERGY MAUI LLC'S
SUBMISSIONS OF INFORMATION**

AND

CERTIFICATE OF SERVICE

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**CLEAN ENERGY MAUI LLC'S
SUBMISSIONS OF INFORMATION**

CLEAN ENERGY MAUI LLC ("Clean Energy Maui") respectfully submits the following SUBMISSIONS OF INFORMATION in the above-referenced proceeding:

Responses by Clean Energy Maui to selected FIT hearing questions

2. Should the FIT be extended to incremental expansions of existing projects?

HECO indicated technical or administrative difficulty in determining how much power would come from incremental additions. We asked HECO and developers to describe to what extent would this be possible?

Upon request, the German government confirmed that with the introduction of the modern FIT in 2000 "all older PV-Systems were allowed to join the new FIT and all older windmills got the new rates of the year 2000".

3. What reliability standards could HECO craft to add transparency, if not predictability, to HECO's reliability determinations for FIT applicants?

Our proposal is to avoid putting up complications for smaller systems. As the FIT is based on payment for variable power, the developer has the maximum incentive to keep his systems operating optimally and HECO has to provide enough backup power to replace the system's input in case it fails. Small system failure will not measurably affect the grid or long-term commitments, such as fuel purchase contracts.

8. Life of the Land and other developers were asked what process the Commission should use in periodic updates to add technologies. They were also asked how the Commission should be kept abreast of relevant technology and industry developments.

Clean Energy Maui and Life of the Land proposed a baseline FIT for any new non-carbon-based, non-nuclear based energy system. Prices for firm and variable energy sources are to be below other costs, such as oil and wind. An interconnection study would make sure that the technical issues were given the necessary attention. This would allow new technologies to enter the market. Basically, if someone offered us reliable renewable energy below the cost of oil, we would be foolish not to take it.

Battery Feed-in Tariff (BFIT)

Clean Energy Maui has developed the world's first Battery FIT (BFIT), based on specific needs on the Hawaiian Islands. It is meant to include all kinds of electricity storage.

Utility-size battery technology is still very limited in scope, with the biggest installations currently in Japan. Pumped storage is a mature technology with complex siting problems. Vehicle-to-grid (V2G) technology is proposed for the future. We feel that a Hawaii BFIT would be of great benefit in stabilizing our grids while keeping most of the investment costs and risks away from rate payers. Furthermore a BFIT could jump-start the entire utility battery industry by giving financing opportunities in the tens of millions of dollars.

Maui and the Big Island currently have a surplus of energy at night that gets curtailed at the cost of the wind farms and is lost forever. This results from grid control issues. The wind farm in Maui produces up to 30 MW. During daytime this is around 15% of the grid and it's variability can be controlled with the existing generators at Maalea. At night the

grid runs as low as 60 MW and the wind farm could produce up to 50% of that energy. Due to generator control constraints and lack of storage, Mecos is unable to control this amount of penetration. As a result, millions of dollars in wind energy are lost.

At other times of the day, energy can be very valuable. First, ancillary energy is needed when wind suddenly stops or a cloud covers the solar panels. Balancing out these short-term variations will increase the potential for more renewable energy on the grid and greatly improve stability. Second, peak power is needed in the middle of the day and in the evening hours to meet increased demand. On the mainland, cost for such power runs as high as 40-60 cents per kWh.

Storage can fill this gap, but utilities are reluctant to invest into storage because of high costs and unknown technology. Wind farms sell energy at low rates that make it impossible to invest in large amounts of storage. However, the price differential between the discarded energy and the high price for ancillary energy presents an excellent opportunity for a storage developer.

A storage developer can reliably earn money by buying the formerly discarded energy at a low price and feeding it into the grid at a higher price. Let's have an educated guess that 40 million kWh/year get curtailed in Maui and the Big Island in the near future. If the BFIT rate is 25 cents higher than the purchase price, earnings will be \$10 million per year. Within a 20-year contract, earnings are \$200 million. This would entice a developer to finance and build large storage systems on the islands.

A BFIT will create great opportunity for storage developers and bring forward a number of proposals if it is priced right. Financing, technology risk and performance risk are carried by the developer. At the current stage of development, this is the prudent way, rather than to burden the ratepayer with those risks.

To calculate the appropriate Feed-in Tariff, it is assumed that the battery gets charged fully at night and discharged during the day and has a lifetime of 20 years. This will be equivalent to 7,300 cycles. The capacity, purchase price and financing cost for the system determine the feed-in tariff rate. A rate between 20 and 30 cents above the energy purchase cost seems appropriate given typical costs of \$1 million per 1,000 kWh of storage. Such a rate would save the ratepayer money, as compared to the cost of running standby generators.

Technical issues, such as location, interconnection, sizing and discharge rates will need to be evaluated project by project through an interconnection study. The developer needs pay those costs.

Proposal

Clean Energy Maui proposes to insert the following language into the ZEL FIT:

1) under "Renewable Energy Source means the following sources of energy:" insert:

Electrical Storage systems including, but not limited to Batteries, pumped storage, distributed and virtual storage

2) in the rate section insert:

Renewable Energy Source: Electrical Storage Systems	
Renewable Energy Generating Facility <u>Storage Capacity (kWh)</u>	<u>Feed-in Tariff Rate (¢/kWh)</u>
≤ 1000 kWh	30.00
> 1000 kWh	25.00

3) as the third paragraph of the Schedule FIT Agreement section insert:

With respect to Renewable Energy fed in by a storage system and delivered to the electric system of the Company, each such Schedule FIT Agreement shall oblige the Company to take all such Renewable Energy on a daily basis, and shall oblige the Company to purchase and pay for such Renewable Energy fed in by the storage system. The storage systems shall have controls in place that allow the Company to select the time and amount of energy being fed into the grid. The Company shall make available at a cost of \$0.05/kWh any excess energy that would have been curtailed otherwise and guarantee a daily supply of energy in the amount of the storage capacity of the storage system.

Updated and annotated final statement from the FIT hearings April 18

The \$1 program for economic growth, energy independence and climate security

[In the interest of ratepayers we need to let them know that there will not be excessive costs. If we don't lead our discussions of the FIT with the cost argument, the FIT opponents will.]

For an increased electricity bill of \$1 per person per month the Feed-In Tariff will:

- Create over 3,000 new jobs and help to build Hawaii's green economy.
- Build massive amounts of clean energy resources.
- Reduce CO2 emissions.

Let's look at this for a moment:

- 1) There are 112 whole countries that have less emissions than the state of Hawaii.
- 2) Per person emissions in Hawaii are higher than in any country in the world, due to our reliance on our tourist industry.
- 3) Hawaii will be heavily impacted by global warming.
- 4) It's our moral obligation to take bold steps against global warming and at the same time it is to our state's benefit.

Back to the benefits of the one dollar per month program:

It will make us safer against oil price increases

And it will make Hawaii more inflation resistant by providing stable prices no matter where inflation and loss of the value of the dollar take us. In fact, inflation works to our advantage and lowers energy cost. [In fact, if we get a high inflation rate, the real value of Heco's fixed FIT payments goes down. Future ratepayers will notice, how clever we were to borrow massive amounts from the mainland to set us up with fixed-price energy systems while inflation ate away the debts.]

How do we do that? By keeping it simple and following successful models around the world.

But we must account for specific issues in Hawaii: Our grids are small and not connected. Some of our grids need modernization first. Some grids cannot take much variable energy. And Hawaii's ratepayers are already stretched to the limits.

Here is how to keep it simple:

- 1) This program will automatically terminate when customer expenses increase above \$1 per person, calculated as average over the next 10 years. [Safety for the ratepayer first.]
- 2) Profitable rates are given for clean energy sources that make it possible for developers and the electric company to build solar, wind, biomass and other installations. These rates remain stable over 20 years or more. There will be a cost-of living increase imbedded in the rates for the variable portion of their costs. This mostly applies to bio-energy. [Safety for the project developers, so that they can get low interest rates]
- 3) There are no project size limits, but large projects need to pay an application fee and an expensive interconnection study before a technical decision can be made when they can connect. Studies can be made through outside consultants, in order not to overwhelm the Heco planning department. [If grid limits are technical in nature, use engineers to find out and find remedies - let's not rule out possible beneficial projects because we suspect that there may be problems. Especially because Heco cannot provide us with numbers for grid limitations, let's have the developers pay for studies to find these out]
- 4) The electric company is obligated to improve it's grid to allow all projects to connect to it. It will first do the less costly improvements. Costs for these upgrades will not be counted as costs for this program, but add to rate base. [This is how it is done in Germany and makes it fair and transparent for developers. Up to now there were so few IPPs that it was proper to let them pay for improvements to the grid, but with 1000s of FIT participants it becomes much less clear who benefits from improvements. CEM inserted the sentence "It will first do the less costly improvements" in order to discourage

developers to present projects with high grid improvement costs. As these could be delayed for years, developers will naturally find locations with low grid improvement and interconnection costs.]

5) The order in which clean energy projects get connected to the grid is determined by grid readiness. This will make sure that developers place projects in locations where no grid updates are necessary.

6) There will be no curtailment. Clean energy producers will be paid for all energy produced. [A FIT is based on a foreseeable amount of payment per year. If there is curtailment, the kWh-rate would need to be increased as in M.El-Gasseir's proposal.]

7) Excess energy is provided at a reduced rate to energy storage systems that will be paid a profitable rate to release this energy at peak times and for grid stability purposes. This storage rate will be an important addition for the Hawaii FIT. [Very important addition]

8) If new energy sources are found, there are minimum rates for firm and for variable energy in place that allows them to be connected right away. These generic rates are below all other rates, including fossil energy. [There should be no size limits]

9) An updated technical specification will define what is expected from clean energy projects to connect in a grid-friendly manner, while minimizing connection costs and making it easy to define interconnection costs in the planning stage.

As you can see, this plan borrows from international experience and yet fits Hawaii. It takes into account the concerns that have been voiced throughout this week. It is important to keep it simple to earn the trust of ratepayers and investors alike. Most of all,

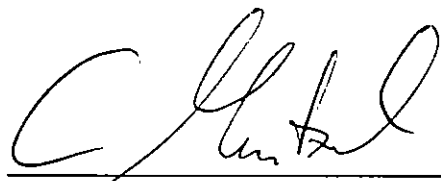
it is a plan for the people of Hawaii and the people of this planet who will benefit in all the ways I have described.

Commissioners, I urge you to adopt this plan for a FIT program in order to make Hawaii fit for a new century. With this we shall set a signal for the 49 other states to follow Hawaii's lead into energy independence and a green economy. We will be a model, for better or for worse, to FIT legislation in every state and many nations - and your decision therefore will have a larger impact on our world than previously imagined.

Thank you commissioners and thank you colleagues for a very instructive and fruitful week where we came as experts and leave as friends.

* * * *

DATED: Kihei, Hawaii, May 7, 2009

A handwritten signature in black ink, appearing to read "Chris Mentzel", written over a horizontal line.

Chris Mentzel
Chief Executive Officer

CLEAN ENERGY MAUI LLC

CERTIFICATE OF SERVICE

I hereby certify that I have this date filed and served the original and eight copies of the foregoing **CLEAN ENERGY MAUI LLC'S SUBMISSIONS OF INFORMATION** in Docket No. 2008-0273, by mail delivery to the Commission at the following address:

CARLITO CALIBOSO
PUBLIC UTILITIES COMMISSION
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I hereby further certify that I have this date served two copies upon the following party of the foregoing **CLEAN ENERGY MAUI LLC'S SUBMISSIONS OF INFORMATION** in Docket No. 2008-0273, by mail addressed to:

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I hereby further certify that I have this date served one copy upon each of the following parties, of the foregoing **CLEAN ENERGY MAUI LLC'S SUBMISSIONS OF INFORMATION** in Docket No. 2008-0273, by causing each such copy thereof to be sent via e-mail in a portable document format ("pdf") to each such party as follows:

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